

**THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**

BUNDA DISTRICT COUNCIL

**FORM TWO PRE-NATIONAL EXAMINATION
033 BIOLOGY**

MARKING SCHEME SEPTEMBER 2023

SECTION A (15 MARKS)

1.

i	ii	iii	iv	v	vi	vii	viii	ix	x
D	C	D	D	B	B	B	D	C	C

2.

i	ii	iii	iv	v
D	B	H	E	G

SECTION B (70 Marks)

Answer ALL questions from this section

3. (a)

- (i) A living organism ...for studying biology
 - (ii) An inanimate object representing a living structure/organismstudying biology
- (1@ =2 marks)

(b)

Antiseptic	Antibiotic
(i) Topical	Taken inside the body
(ii) Kills a wide range of germs	Kills bacteria

(1@ = 4 marks)

(c)

- (i) Cell wall:
Onion:...cellulose...

Mushroom:...Chitin... (1@ =2 marks)

- (ii) Form of carbohydrate stored:

Onion:...Starch...

Mushroom:...Glycogen (1@ =2 marks)
(Total: 10 marks)

4. (a) State any six adaptations of the parts of the heart to their functions:

- (i) The heart has muscles that are never fatigued.
- (ii) The heart has Sino Atrial Node that act as a pacemaker by regulating the heartbeat rates and excitation of the heart.
- (iii) There are coronary arteries which lay over the heart surface to provide the heart muscle itself with oxygenated blood.
- (iv) Has muscular ventricles, with the left ventricle being more muscular to facilitate pumping of the oxygenated blood around the body.
- (v) There are tricuspid and bicuspid valves between the atria and the ventricles, which ensure the blood flows upwards into the major arteries and not back into the atria.
- (vi) At the base of the major arteries, there are semilunar valves which prevent the blood returning to the heart as the ventricles relax.
- (vii) There is pericardium (pericardial membrane) around the heart that produces lubricating fluid and supports the heart.
- (viii) The heart is surrounded by a fat layer that acts as a shock absorber.

(Any six...1@ =6 marks)

(b) ...lack any of the AB antigens (group O = group zero) and lacks rhesus antigen, therefore it can be given to recipient of any blood groups since there is no antigen to cause reactions with the antibodies of the recipient...in case of emergencies it is often used more than other groups, therefore winding up is overused and consequently in short supply. (4 marks)

(Total: 10 marks)

5. (a)

- (i) a role and position a species has in its environment.
- (ii) Interaction between different species of organisms; it include competition for resources and predation.

- (iii) This is the interaction among members of the same species; for example interactions in reproduction and feeding. (1@ = 3 marks)
- (b) Food web...interlinked food chains; a food chain is a linear feeding relationship starting from producers and ends at top consumers or decomposers. (2 marks)
- (c) Use names of any real organisms to represent the following trophic levels and draw a diagram of a food web containing all of the seven organisms you have named:
- Grass
 - Rabbit and a goat
 - Snake and Lion
 - A hawk
 - Bacteria
- (00 ½ @ = 3½ marks)

A food web diagram:

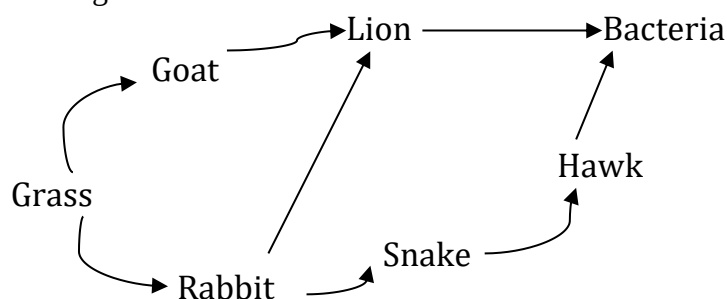


Diagram: (1½ marks)

(Total: 10 marks)

6. (a) Breathing is the ventilation of lungs which involves inhalation/inspiration and exhalation/expiration while gaseous exchange is the movement of oxygen and carbon dioxide across respiratory surfaces. (2 marks)
- (b) During exhalation the diaphragm muscles relax (1pt) and the diaphragm moves back upward (1pt), at the same time the intercostal muscles relax (1pt) and pull the ribcage inwards and downwards(1pt). As a result, the volume of the thoracic cavity decreases(1pt), pressure increases(1pt) and air is forced out. (6 marks)
- (c)
- Providing energy during strenuous/vigorous activities when oxygen intake is insufficient...
 - production of useful products such as lactic acid used the food industry to make yoghurt/alcohol...(1@ = 2 marks)
- (Total: 10 marks)**
7. (a) Holozoic: food is ingested and then digested internally.... Saprophytic: digestive enzymes are secreted on the food material which is then externally digested and then nutrients... (1 marks)

(b)

Nutrient	Location of digestion	Enzyme involved in the digestion	End product of digestion
Starch	Mouth (00½ pt)	Ptyalin (Salivary Amylase) (00½ pt)	Maltose(00½ pt)
Protein	Stomach(00½ pt)	Pepsin(00½ pt)	Peptides(00½ pt)
	Duodenum(00½ pt)	Trypsin(00½ pt)	
Lipids	Duodenum (00½ pt)	Pancreatic lipase Lipase(00½ pt)	Fatty acid and glycerol(00½ pt)
	Ileum(00½ pt)		
Maltose	Ileum (Small intestine) (00½ pt)	Maltase(00½ pt)	Glucose(00½ pt)
Peptides	Ileum (Small intestine) (00½ pt)	Peptidase(00½ pt)	Amino acids(00½ pt)

(Total: 10 marks)

8.

(a)

- (i) They cause decomposition of matter hence releases nutrients to plants.
- (ii) Some aid in digestion, example the bacteria in the gut of the ruminants.
- (iii) Some produce vitamins K and B₁₂ in the human gut.
- (iv) Some convert atmospheric nitrogen to nitrates for plant use.
- (v) Some are used in the production of antibiotics.
- (vi) Some are used in making vaccines.
- (vii) Some are used in sewage treatment (They decompose pollutants).
- (viii) Some are used in the food industry for cheese production, yogurt and sauerkraut production.
- (ix) Some are used in genetic engineering to produce insulin.
- (x) Autotrophic bacteria release oxygen in the atmosphere.
- (xi) Some are used in biological researches. (Any eight., 1@ = 8 marks)

(a) Give two disadvantages of bacteria:

- (i) They cause diseases
- (ii) They spoil foods (Any two., 1@ = 2 marks)

(Total: 10 marks)

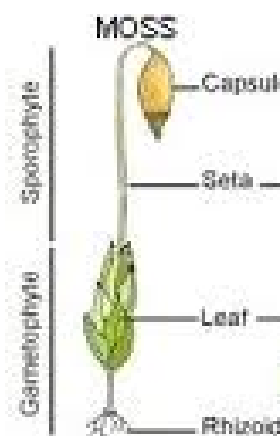
9.

(a)

- (i) They show alternation of generations and the gametophyte generation is dominant

- (ii) The gametophyte is differentiated into simple leaves, stem and rhizoids (hence has no true leaves, stems and roots). Rhizoids are hair like structures that absorb nutrients for the moss plant.
- (iii) They don't have vascular tissues (they don't have xylem and phloem)
- (iv) They reproduce sexually and asexually; sexual reproduction occurs in the gametophyte while asexual reproduction occurs in the sporophyte.
- (v) The sporophyte is totally dependent on the gametophyte for food
- (vi) They are found in damp, shady places (Any four..1@ = 4 marks)

- (b) A labeled diagram of the moss plant showing the gametophyte, sporophyte, seta, capsule, leaf like structures and rhizoids.



(Diagram: 2½ pts, Title: 00 ½ pt, labels: 6 × ½ pt@ =3 marka)
(Total: 10 marks)

SECTION C (15 Marks)

10.

Syphilis

Cause:

It is caused by an organism/ a bacterium called *Treponema pallidum*. **(1 mark)**

Transmission:

It can be transmitted mainly through sexual intercourse. **(1 mark)**

It can also be transmitted from mother to child through placenta. **(1 mark)**

Symptoms:

- A hard swelling and ulcer may develop on sexual organs.
- If bacteria has invaded the body, it may cause skin rash and swollen lymph nodes.
- If not treated early, the spirochaetes form pockets of permanent infection in the body, causing inflammation, persistent ulcers and obstruction of the arteries. **Any two = 1½@ -= 3 marks)**

Effects:

- If bacteria invades heart or brain, they cause death. **(1½ pt)**
- In pregnant women, *Treponema* bacteria can get across the placenta and infect the foetus. The infected foetus becomes mentally retarded and dies at an early age. **(1½ pt)**

Prevention:

- Avoiding irresponsible sexual behaviour. **(1½ pt)**

Treatment:

- Antibiotics such as benzathine, penicillin and tetracycline are used to treat syphilis. **(1½ pt)**
- (3 remaining marks for writing in an essay form)**